45. (Once amended) The method in claim 44, wherein said step of etching further comprises etching generally simultaneously with performing said deposition.

A marked-up version of these claims appears in an appendix to this Amendment and Response

Remarks

Claims 20-22 and 44-46 were pending up to this Amendment.

Claims 20-22 and 44-46 were rejected.

Claims 20-22 are cancelled without prejudice.

Claims 44-45 are amended.

Claims 44-46 are pending as of this Amendment.

I. Provisional rejection of claims based on double patenting

The Examiner provisionally rejected the claims based on other claims presented in related application serial no. 09/470,651. Applicants have cancelled claims 20-22 in order to pursue them in that related application. Further, in that related application, Applicants have canceled the claims corresponding to claims 44-46 in the present application. Moreover, Applicants have cancelled the analogous claims in another related application – 09/470,650. To support these assertions, Applicants have included the relevant documents of these applications in an IDS filed concurrently herewith. Accordingly, Applicants contend that the claims should no longer be subject to this provisional rejection.

II. Rejection of claims under 35 U.S.C. §103

The Examiner rejected claims 44-46 as being obvious in light of U.S. Patent No. 6,089,183 (Imai) in combination with U.S. Patent No. 5,084,413 (Fujita). In rejecting these claims, Applicants note that the Examiner did not address the claim language but rather appeared to apply Imai and Fujita to the exemplary embodiment depicted in figures 1-4 of the application. Applicants note that the claims are not limited to that exemplary embodiment. Regardless of how the Examiner rejected these claims, Applicants assert that the Examiner's arguments fail to meet the *prima facie* burden required for rejection for at least three reasons. First, the Examiner's rejection is based upon a misinterpretation of Imai. Second, the Examiner failed to consider the references as a whole. Third, there is no motivation to combine the cited references, and there is in fact motivation to prevent their combination. Any one of these reasons is sufficient to withdraw the rejections. The reasons are addressed separately below.

A. The Examiner's rejection is based upon a misinterpretation of Imai

The Examiner stated that Imai teaches forming a polymer inside a recess, citing Imai's text from column 12, line 55 through column 13, line 25. (Office Action of 11/21/00 at p. 3, ln. 4.) The Examiner even went so far as to suggest that Imai teaches filling the recess with polymer. (***Id.*** at 3, ln. 9-10.) Moreover, the Examiner expressed that specific portions of Imai were sought out and relied upon to reject the claims. (***Id.*** at p. 4, ln. 6-8.) However, the Examiner's interpretation of the cited text (1) is incorrect and (2) actually favors non-obviousness. The cited text is part of "Example 1" in Imai's detailed description of the preferred embodiments. The goal of Imai's "Example 1" is to plasma etch holes through a layer, wherein the holes have vertical sidewalls. The holes may be used to allow electrical contact between different levels of a device. Alternatively, the holes may serve to expose portions of an underlying oxide layer; wherein the exposed oxide portions are then subjected to further oxidation, thereby forming isolation regions.

The Background section of Imai's specification indicates that problems arose in prior art attempts to plasma etch holes with vertical sidewalls. These problems were due to the presence of polymers in the hole. (Imai at col. 3, ln. 45-65.) Specifically, Imai notes that carbon-based gases such as CHF_3, CH_2F_2, CF_4, or a like gas, combined with O_2, H_2 or like gas, are known plasma etchants. (***Id.*** at col. 3, ln. 19-27.) Imai further indicates that the act of plasma etching itself created the polymers from the carbon-based gases. (***Id.*** at ln. 28-44.) Imai also notes that the polymers are resistant to etching. (***Id.***) As a result, the polymers' presence causes the holes' sidewalls to slope inward towards the bottom of the hole. (***Id.*** at ln. 28-40; col. 3, ln. 45-56; Imai's fig. 22b.) The result is a shift in the intended pattern of holes, which can be detrimental to the formation of either a contact or an isolation region. (***Id.*** at col. 3, ln. 45-col. 4, ln 1.) Moreover, Imai specifies that the polymers form a dust in the chamber that interferes with device fabrication and requires undesirable maintenance efforts for the chamber. (***Id.***)

It is this problematic prior art process that is addressed in the first part of the Examiner's citation:

> When the mixture gas of a typical fluorocarbon gas such as CHF_3, CH_2F_2, and CF_2 and an O_2, H_2 or like gas is used as the etchant gas, carbon atoms or carbon hydride resolved from fluorocarbon gas and photoresist volatile by the generation of SiF_4 are subjected to radical polymerization, thus forming polymers resulting in a polymer film, as shown in FIG. 3(a).

(***Id.*** at col. 4, ln. 55-61.), wherein Imai mentioning the same gases addressed in the Background and Imai's use of the term "typical" indicates that the problematic prior art process is being referred to.

The Imai text cited by the Examiner continues by offering an alternative that avoids these problems by avoiding the creation of a polymer. Specifically, Imai teaches adding ClF_3 to the process chamber before a plasma is generated. Absent that plasma, ClF_3 generates fluorine radicals that cover the inner wall of the apparatus, the electrodes, and the surface of the substrate. The carbon-based etchant gas is subsequently introduced, and a plasma is generated. The resulting carbon atoms or carbon hydride molecules react with the fluorine radials, forming carbon-fluorine molecules, which are

easily disposed of, rather than the undesirable polymers. (***Id.*** at col. 12, ln. 61 - col. 13, ln. 10.) The remainder of the text cited by the Examiner explains further how the absence of polymers is beneficial by helping to prevent the formation of both dust and inwardly-sloping sidewalls of an etched hole. (***Id.*** at col. 13, ln. 11-25.)

Thus, the Examiner's misinterpretation of the very text cited by the Examiner results in a failure to support the rejection of the claims. Further, the Examiner's efforts to pinpoint particular relevant in Imai text actually highlight portions that teach away from forming any polymer inside a recess, let alone filling the recess with polymer. As a result, the Examiner has defeated the argument against allowance and has instead supported the non-obviousness of the claims.

B. The Examiner failed to consider Imai and Fujita as a whole

Moreover, Applicants posit that the Examiner's misinterpretation may be a result of Examiner focusing too much on one particular portion of Imai's text without considering its context as part of the whole specification, which leads to another aspect of the problem with the Examiner's rejection. Specifically, it was legally improper for the Examiner to focus on "specific portions of *Imai*" (Office Action of 11/21/00 at 4) and Fujita without consideration of those references as a whole.

The impropriety of overlooking the overall teachings of references and instead picking and choosing particular features from references is addressed by case precedent:

> When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself. There must be "something in the prior art *as a whole* to suggest the desirability, and thus the obviousness, of making the combination." . . . Not only must the claimed invention as a whole be evaluated, but so also must the references *as a whole,* so that their teachings are applied in the context of their significance to a technician at the time -- a technician without our knowledge of the solution.

(***Interconnect Planning Corp. v. Feil***, 774 F.2d 1132, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985) (citations omitted) (emphasis added). *See also* ***W.L. Gore & Associates, Inc. v. Garlock, Inc.***, 721 F.2d 1540, 220 U.S.P.Q. 303, 308, 311 (Fed. Cir. 1983) (requiring that section 103 references be assessed in their entireties), *cert. denied*, 469 U.S. 851 (1984). These cases are provided in an appendix to this Amendment and Response.)

Applicants contend that the Examiner has failed to consider the Imai and Fujita references *as a whole* and instead focused only on what was believed necessary to reject the claims. In doing so, the Examiner took the teachings out of context and failed to consider how a technician at the relevant time – one without knowledge of the solution – would view these references. The Examiner's failure to address the references as a whole provide yet another indication that the Examiner has not satisfied the *prima facie* burden for rejecting the claims.

C. There is no motivation to combine Imai and Fujita, and there is in fact motivation to prevent their combination

Moreover, had the Examiner attempted to consider how one of ordinary skill in the art would view these references, Applicants submit that the Examiner would have found that their teachings conflict on so fundamental a level that their combination would have been discouraged. Relevant to this is the Examiner's conclusion that it would be obvious to combine the teachings of Imai and Fujita "for the purpose of forming a conventional capacitor storage node." (Office Action at p. 3, last line.) Imai, while making brief references to a polycide film for a bit line, significantly indicates that its capacitor storage node (element 62) is made of polysilicon. (Imai at col. 17, ln. 57-58.). Further, Imai illustrates that the polysilicon material of its capacitor extends all the way through the insulating film 61 to the active area of the substrate. (***Id***. at fig. 11.) Hence, Imai teaches that it is perfectly acceptable to fill a hole in the insulation with polysilicon "for the purpose of forming a conventional capacitor storage node." Fujita, however, emphasizes a method to fill a hole with metal, wherein there is trouble doing so in the prior art because metal-deposition methods known at that time could not accommodate a hole defining a sub-micron diameter. (Fujita at col. 1, ln. 10-25.) Because Imai teaches filling its hole with polysilicon "for the purpose of forming a conventional capacitor

storage node," there is no need to apply Fujita's metal fill technique, and doing so would in fact require additional time, money, and effort, thereby discouraging one of ordinary skill in the art from combining the teachings of the two references. As a result, the Examiner is mistaken in the assumptions concerning motivation to combine Imai and Fujita, thereby indicating a failure in meeting the *prima facie* burden.

CONCLUSION

In light of the above amendments and remarks, Applicants submit that claims 44-46 are allowable. If there are any matters which may be resolved or clarified through a telephone interview, the Examiner is requested to contact Applicants' undersigned attorney at the number indicated.

Respectfully submitted,

Date 5/21/1

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Appendix I: Marked up version of claims

44. (Once amended) A method of providing a polymer between metal features on a wafer, comprising:

performing a deposition on said wafer in a site; and

etching [said wafer] in the same general site used to perform said deposition.

45. (Once amended) The method in claim 44, wherein said step of etching [said wafer] further comprises etching [said wafer] generally simultaneously with performing said deposition.